

HOISTING AND RIGGING	Manual Document Page Issue Date	USQ #12-1261-S Engineering TFC-ENG-FACSup-C-25, REV C-1 1 of 18 July 27, 2012
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[Ownership matrix](#)

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1.0 PURPOSE AND SCOPE

(7.1.1, 7.1.2, 7.1.3, 7.1.4)

This procedure defines the process for conducting hoisting and rigging activities for WRPS. It also provides instructions for preparing hoisting and rigging instructions (e.g., critical or special lift determination (A-6003-884), critical lift plans, and special lift instructions). This procedure also defines the process to ensure the structural integrity of permanently installed lifting points.

TFC-CHARTER-31 provides the hoisting and rigging program charter. The safety procedure TFC-ESHQ-S-STD-28 also provides safety-related hoisting and rigging requirements.

Hoisting and Rigging activities within the scope of this procedure must comply with DOE-RL-92-36, "Hanford Site Hoisting and Rigging Manual," as well as TFC-ESHQ-S-STD-28 and this procedure.

2.0 IMPLEMENTATION

The procedure is effective on the date shown in the header.

3.0 RESPONSIBILITIES

Responsibilities are contained within Section 4.1- 4.6.

4.0 PROCEDURE

For general requirements, see section 4.0, "General Requirements" of TFC-ESHQ-S-STD-28.

4.1 General Instructions

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| Field Work Supervisor | <ol style="list-style-type: none">1. Coordinate and supervise performance of planned lifts.2. Verify that the hoisting and rigging contractor has inspected and evaluated all lifting points as required by DOE-RL-92-36 and that all concerns have been adequately addressed and documented in the work package. Contact a qualified Rigging Engineer for any additional lifting point concerns.3. Verify that required tags have been installed and the information on the tags is correct.4. Ensure all other lifting bail tags that are not in accordance with this procedure are removed.5. Ensure pre-job briefings are performed in accordance with TFC-OPS-MAINT-C-02.6. Ensure all lifts are performed in accordance with applicable procedures, instructions, DOE-RL-92-36, TFC-ESHQ-S-STD-28, and this procedure.7. For all special lifts, ensure that form "Hoisting and Rigging: Lift Instructions Determination" (A-6003-884) is complete and all required signatures are present before performing the lift. |
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	8.	Verify the crane load chart rating and crane capacity in the intended configuration with the designated lead (DL) and crane operator prior to conducting the lift.
	9.	If the load being lifted is 80% or more of the crane's maximum rated capacity or, 90% or more of the crane's load chart capacity ensure a Critical Lift Plan is used to perform the lift.
	10.	Ensure that the Critical Lift Plan is consistent with the work package.
Rigging Engineer	11.	Ensure all field revisions to critical lift plans and special/engineered lift plans are made in accordance with DOE-RL-92-36 section 3.5.2 "Critical Lift Plan Field Revision."
	12.	Ensure any revisions to wording match revisions to sketches.
Quality Assurance	13.	For first time lifts of cover blocks, ensure tags are installed on each cover block listing the following information: <ul style="list-style-type: none"> • Work order number • Weight of component in pounds • Key block (if applicable) • Test date. <p>NOTE: Tagging of any other items (cover plates, shield plugs, etc.) is at the discretion of the system/component engineer.</p>
Designated Leader	14.	Perform pre-lift and pre-job requirements in accordance with DOE-RL-92-36, TFC-OPS-MAINT-C-02, and this procedure.
	15.	Perform all lifts as designed and approved.
	16.	Ensure the, "Riggers and Operators Field Verification Checklist For Special Lifts" (located on A-6003-884), is completed and approved for all special lifts prior to the lift being performed.
		NOTE: This checklist is not required for critical lifts.

4.2 Critical and Special/Engineered Lifts

Currently a Critical Lift Plan is defined in DOE-RL-92-36 as "a step-by-step plan or work instructions ..." DOE-RL-92-36 does not provide this direction for a Special/Engineered Lift Plan and therefore is not a "step-by-step" instruction unless noted otherwise. The Special/Engineered Lift Plan provides pre-identification of load weight, load center of gravity, lift attachment points and minimum lifting hardware (e.g., slings, below-the-hook lifting devices, shackles, spacers, softeners, etc.) capacities that will be used for the lift or series of lifts of non-critical items.

4.2.1 Critical Lifts

Facility Manager/
Project Manager

1. Determine facility or project hoisting and rigging needs and scheduled work activities.

A lift shall be designated “critical” based on the following criteria. In addition, any lift not subject to the following criteria may be designated critical as determined by the facility or project manager:

- Loss of control of the item being lifted would likely result in declaration of a “Site Area Emergency” or “General Emergency” as defined in the facility emergency plan or construction site emergency plan.
- The item being lifted is unique and, if damaged, would be irreplaceable or not repairable and is vital to a system, facility, or project operation.
- The cost to replace or repair the item being lifted, or the delay in operations of having the item damaged would have a negative impact on facility, organizational, or U.S. Department of Energy (DOE) budget to the extent that it would affect program commitments.
- The item, although non-critical, is to be lifted above or in close proximity to a critical item or component.
- The load being lifted is 80% or more of a mobile crane’s gross load chart rating (total maximum capacity of the crane) or 90% or more of the crane’s load chart rating in any configuration for the maximum radius to be experienced.

NOTE: In this situation the radius shall be verified by actual measurement and not by the LMI alone.

- Multiple crane lifts where the load exceeds 50% of the capacity of any crane used in the lift based on the configuration and position of the crane as used for the lift.

NOTE: Multiple crane lifts shall not exceed 75% of the individual crane capacities as configured for the lift.

2. If a lift is considered critical, complete and sign the Lift Instructions Determination form (A-6003-884).
3. Relay to the area task planner, the proposed hoisting and rigging needs and requirements.

Planner

4. Coordinate development of the Critical Lift Plan in accordance with the guidelines set forth in the “Hoisting and Rigging: Lift Instructions Determination” (A-6003-884) and this procedure.

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| | 5. Include the original Critical Lift Plan as part of the work package as the implementing document for the pre-job briefing and performance of the lift(s). |
| Manager responsible for lift/Rigging Engineer/System Engineer | 6. Complete the “Hoisting and Rigging: Lift Instructions Determination” form (A-6003-884). Once completed, this form, along with any sketches and/or additional information, will serve as the guidance and direction for preparing the Critical Lift Plan. |
| Planner | 7. Ensure that the completed form (A-6003-884) contains the required signatures and is delivered to the hoisting and rigging contractor for development of the critical lift plan. |
| Critical Lift Plan Preparer (Author) | 8. Using the completed and approved A-6003-884 form as guidance and direction, prepare the Critical Lift Plan and return it to the facility/project planner. |
| Planner | 9. Route the completed Critical Lift Plan for approval. |
| | 10. At a minimum, ensure that the Critical Lift Plans contain signatures from the following personnel: |
| | <ul style="list-style-type: none"> • Technical Approver – Qualified person having technical knowledge of the hoisting and rigging equipment, as designated by the responsible hoisting and rigging contractor • Qualified Rigging Engineer • Responsible Field Work Supervisor (FWS) • Qualified Occupational Safety Representative – normally a field safety representative • Responsible manager – normally the facility or project manager. |

NOTE 1: Additional signatures may be added as required by the facility or project manager.

NOTE 2: Once the Critical Lift Plan is completely signed off it can only be changed by “field change” process according to DOE-RL-92-36 or, as a document revision.

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Rigging Engineer	11.	Ensure that Critical Lift Plan instructions include the following statement when applicable: “Engineering has established the Recommended Not-To-Exceed Lifting Pull limit as xxxx lbs.” NOTE: This applies to lifting items that may be rusted in place or otherwise potentially stuck.
	12.	For Critical Lifts, if test documentation is not available for permanently installed rigging hardware, ensure that appropriate supporting calculations, design media, inspection requirements, torque requirements, and hoisting and rigging requirements are included prior to approving the critical lift plan/special lift instructions.
	13.	Review the Critical Lift Plan instruction and determine if it is ready for implementation. a. If it meets conditions for approval, sign and return the plan/instruction to the planner. b. If it does not meet conditions for approval, return the plan/instruction to the planner with recommendations for revision.
	Safety & Health	14.
	15.	Ensure subcontractor’s Critical Lift Plans and critical lifts they perform are approved by the subcontractor’s internal safety organization prior to approval.
	16.	Review and approve by signing the Critical Lift Plan.
System Engineer	17.	Ensure the Critical Lift Plan is consistent with the work package.
Planner	18.	Ensure the lift plan has the work package number or Document Release Form (DRF) number.
	19.	Submit the work package for approval in accordance with TFC-OPS-MAINT-C-01 .
		NOTE 1: If the lift is performed without a work package then the plan shall be released using a DRF form per TFC-ENG-DESIGN-C-25.
		NOTE 2: The completed “Hoisting and Rigging: Lift Instructions Determination” (A-6003-884) form is included in the work package for information. The “Riggers and Operators Field Verification Checklist For Special Lifts,” is not required for Critical lifts and should be discarded prior to entering A-6003-884 into the work package.

20. Complete all applicable post-lift documentation.

NOTE: Documentation for critical lifts is retained in CHAMPS/IDMS as part of the completed work package.

4.2.2 Special/Engineered Lifts

Facility Manager/
Project Manager

1. Determine facility or project hoisting and rigging needs and scheduled work activities.

NOTE 1: Special/Engineered lifts encompass the planned engineered lifts per the American Society of Mechanical Engineers (ASME) and lift plans per 29 CFR 1926.1432. A lift shall be designated as “Special/Engineered” based on the following criteria. In addition, any lift not subject to the following criteria may be designated as “Special/Engineered” as determined by the facility or project manager.

NOTE 2: Special/Engineered lift(s) may include, but are not limited to the following:

- Handling large or unusually configured loads outside a fork truck’s load center

NOTE: The requirements found in DOE-RL-92-36, Chapter 6, “Forklift Trucks,” paragraph. 6.12, item d, shall be followed when handling large or unusually configured loads outside a fork truck’s load center.

- Loads that are close to an existing building or operating equipment that if dropped or upset would cause damage to building or equipment
 - Non-routine rigging configurations being used or items requiring special care because of size, weight, close-tolerance installation, or high susceptibility to damage
 - Two crane lifts and multiple crane lifts that do not meet the requirements for a “Critical Lift”
 - Mobile crane pick & carry operations
 - Working near power lines
 - Lifting Personnel.
2. If a lift is considered Special/Engineered, complete and sign the Hoisting and Rigging: Lift Instructions Determination form (A-6003-884).
 3. Relay to the area task planner the proposed hoisting and rigging needs and requirements.

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Planner	<div>4. Coordinate development of the Special/Engineered Lift Instructions in accordance with the guidelines set forth in the “Hoisting and Rigging: Lift Instructions Determination” form (A-6003-884) and this procedure.</div> <div>5. Include the original Special/Engineered Lift Plan as part of the work package as the implementing document for the pre-job briefing and performance of the lift(s).</div>	
Manager responsible for lift/Rigging Engineer/System Engineer	<div>6. Complete the “Hoisting and Rigging: Lift Instructions Determination” form (A-6003-884).</div> <div>NOTE 1: Once completed, this form, along with any sketches and/or additional information, will serve as the guidance and direction for preparing the Special Lift Plan.</div> <div>NOTE 2: Special conditions are included in the form, which is used to capture necessary information to be included in the lift plan such as the use of spacers and spreader beams.</div>	
Planner	<div>7. Ensure that the completed form (A-6003-884) contains the required signatures and is delivered to the hoisting and rigging contractor for development of the special/engineered lift plan.</div>	
Special/Engineered Lift Plan Preparer (Author)	<div>8. Using the completed and approved A-6003-884 form as guidance and direction, prepare the Special/Engineered Lift Plan and return it to the facility/project planner.</div>	
Planner	<div>9. Route the completed Special/Engineered Lift Plan for approval.</div> <div>10. At a minimum, ensure Special/Engineered lift plans contain signatures from the following personnel:</div> <div><ul style="list-style-type: none">Technical Approver – Qualified person having technical knowledge of the hoisting and rigging equipment, as designated by the responsible hoisting and rigging contractorQualified Rigging EngineerResponsible FWSQualified Occupational Safety Representative – normally a field safety representativeResponsible manager – normally the facility or project manager.</div> <div>NOTE 1: Additional signatures may be added as required by the facility or project manager.</div> <div>NOTE 2: Once the Special/Engineered Lift Plan is completely signed off it can only be changed by “field change” process according to DOE-RL-92-36 or, as a document revision.</div>	

Rigging Engineer 11. Ensure that special/engineered lift plans include the following statement when applicable:

“Engineering has established the Recommended Not-To-Exceed Lifting Pull limit as xxxx lbs.”

NOTE: This applies to lifting items that may be rusted in place or otherwise potentially stuck.

12. For special/engineered lifts, if test documentation is not available for permanently installed rigging hardware, ensure that appropriate supporting calculations, design media, inspection requirements, torque requirements, and hoisting and rigging requirements are included prior to approving the special/engineered lift plan.

13. Review the special/engineered lift plan and determine if it is ready for implementation.

a. If the special/engineered lift plan meets the conditions for approval, sign and return the special/engineered lift plan to the planner.

b. If it does not meet conditions for approval, return the special/engineered lift plan to the planner with recommendations for revision.

Safety & Health 14. Perform functions as the “responsible Safety organization” in accordance with DOE-RL-92-36.

15. Ensure that the subcontractor’s special/engineered lift plans and special/engineered lifts they perform are approved by the subcontractor’s internal safety organization prior to approval.

16. Review and approve by signing the Special/Engineered lift Plan.

System Engineer 17. Ensure the Special/Engineered Lift Plan is consistent with the work package.

Planner 18. Ensure that the lift plan has the work package number or DRF number.

19. Submit the work package for approval in accordance with [TFC-OPS-MAINT-C-01](#).

NOTE 1: If the lift is performed without a work package then the plan shall be released using a DRF form per TFC-ENG-DESIGN-C-25.

NOTE 2: The completed A-6003-884 form is included in the work package for information. Form A-6003-884, Riggers and Operators Field Verification Checklist, is required for all special/engineered lifts and must be included in the work package.

20. Complete all applicable post-lift documentation.

NOTE: Documentation for special/engineered lifts is retained in CHAMPS/IDMS as part of the completed work package.

4.3 Lifting Point Inspection Preparation for Critical and Special/Engineered Lifts

The process for verification of lifting point structural integrity is shown in [Figure 1](#).

Lifting point inspections shall be performed using a graded approach. Cover blocks/cover plates with permanently installed lifting points shall be inspected using Section 4.6, and evaluated using RPP-8360. Shield plugs shall be inspected and evaluated as determined by the system/component engineer. Non-analyzed shield plugs should be lifted using a spacer. Items to be lifted will be inspected and evaluated in accordance with DOE-RL-92-36 by the hoisting and rigging contractor, including lift points under multiple (stacked) cover blocks or where lifting points are difficult to access. The need for additional inspection and evaluation is at the discretion of the rigging engineer, the system engineer, or the component engineer.

NOTE: Cover blocks/cover plates that will not be lifted over tank farm structures (such as underground storage tanks, catch tanks, double-contained receiver tanks) and are not considered critical or special/engineered lifts only require inspection and evaluation by the hoisting and rigging contractor per DOE-RL-92-36.

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| Field Crane Coordinator | 1. Ensure lift schedule is available to the system/component and hoisting and rigging engineers. |
| System/Component Engineer | 2. Follow TFC-ENG-DESIGN-D-37; provide supporting documentation to planner, as needed. |
| Planner | 3. Prepare a field inspection folder, if requested by the system/component engineer, containing pertinent lifting point drawings, Engineering Change Notices (ECNs), and a blank Lifting Point Field Inspection Report for each lifting point.

4. Ensure that the work order supports the field inspection. |

4.4 Field Inspection

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| Quality Assurance | 1. If required by Engineering, perform field inspections in accordance with Section 4.6. <ol style="list-style-type: none"> a. Ensure that traceability is maintained between inspection documents and the inspected lifting point (e.g., tags). b. Deliver the Lifting Point Field Inspection Report to the system/component engineer. |
| System or Component Engineer | 2. Evaluate the field inspection report (in accordance with TFC-ENG-DESIGN-D-37), and based on findings, perform the required actions to ensure that the identified lifting points can be safely used. |

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| Rigging Engineer | 3. Evaluate corrective actions and approve ECNs in accordance with TFC-ENG-DESIGN-D-37. |
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4.5 Structural Analysis

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| System or Component Engineer | 1. Perform structural analysis and determine lifting points in accordance with TFC-ENG-DESIGN-D-37 and provide data to planner. |
| Engineering Discipline Lead - Civil/Structural Discipline | 2. Determine the type of calculation required in accordance with TFC-ENG-DESIGN-C-10 . A letter of appointment may be issued to identify approved alternates for this determination. |
| Analyst | 3. Perform structural evaluation of lifting points in accordance with TFC-ENG-DESIGN-C-10 and RPP-8360. |
| System or Component Engineer | <p>4. Based on the structural evaluation, determine if the lifting point(s) is adequate to lift the intended item (e.g., cover block, cover plate, shield plug) and verify tags are in place as applicable (see Section 4.1, steps 3 and 10).</p> <p>a. If adequate, notify the planner and provide the planner with a copy of the analytical calculations.</p> <p>b. If inadequate, contact the Engineering Discipline Lead - Civil/Structural, for a resolution (RPP-9514).</p> |
| Analyst | <p>5. Record analysis as required by TFC-ENG-DESIGN-C-10. Document computational calculations on (A-6003-884), item 9.</p> <p>6. Release the record inspection report results and analysis per TFC-ENG-FACSUP-C-02. Upload an electronic copy of this information into the Integrated Data Management System (IDMS) Lifting Point database.</p> |

4.6 Inspection of Existing Permanently Installed Lifting Points

This section ensures that lifting points are inspected and that the inspection findings are correctly provided in the evaluation package (see Figure 2).

The Lifting Point Field Report (site form A-6003-764 or A-6003-765) records the observed condition of existing lifting points for comparison to lifting point design documentation and supporting calculations.

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| System/Component Engineer | <p>1. Evaluate if Quality Assurance (QA) field inspection is needed.</p> <p>2. If the decision is made to not use QA field inspection, photograph the lifting point(s).</p> |
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Quality Assurance Technician	3.	Document observations in Lifting Point Field Report By Engineer (A-6003-764) as well as Field Inspection Document Index (A-6003-766).
	4.	If a decision is made to use QA field inspection (A-6003-765), prepare inspection folder.
	5.	If measuring and test equipment will be used in the inspection process, record the manufacturer, model, serial number, and calibration status in Section 6.0 of A-6003-765.
	6.	Using the documents specified by the planner in the Field Inspection Document Index (A-6003-766), perform an inspection of each lifting point e.g., cover block, cover plate, shield plug, identified.
	7.	To the maximum extent practicable, complete an inspection report for each lifting point.
	a.	If any part of the QA inspection (A-6003-765) cannot be completed, record the reason for non-completion on the Lifting Field Inspection Report (A-6003-765) and appropriately annotate the steps that will not be completed.
	b.	If corrosion is present, other than superficial surface rust, inform the system engineer.
	c.	Submit the completed Lifting Point Field Inspection Report to the system/component engineer.
		NOTE: The lifting point inspection report, by itself, does not determine if a lifting point is safe to use.
System/Component Engineer	8.	Review the Lifting Point Field Inspection Report for completeness and accuracy.
	9.	Determine if additional inspection or Non-Destructive Examination (NDE) is required and specify any additional inspection or NDE in Section 5.0 of the Lifting Point Field Inspection Report form (A-6003-765).
	10.	Return the Lifting Point Field Inspection Report to Quality Assurance if additional inspection or NDE is required.
		NOTE: All additional inspection and/or NDE results shall be noted and recorded on the Lifting Point Field Inspection Report.
	11.	Sign the Lifting Point Field Inspection Report when the report is complete, and forward the report to an analyst and put an electronic copy into IDMS.

5.0 DEFINITIONS

First time lift. Any lift performed on a cover block that does not have a weight tag installed in accordance with this procedure.

Outrigger pad. Blocking which is placed under a crane's outrigger floats to provide greater stability for the crane.

Permanently installed lifting point. Any lifting point that is a permanent part of the item to be lifted or a lift point that is left in place on the item to be lifted.

Temporary installed lifting point. Lifting points installed for specific lifts and subsequently removed. These lift points are considered rigging hardware and are addressed by DOE-RL-92-36 (e.g., temporarily installed swivel hoist rings and shouldered eye bolts).

6.0 RECORDS

The following records are generated during the performance of this procedure:

- Work Order package or released using a DRF form per TFC-ENG-DESIGN-C-25, which may include the following:
 - Critical Lift Plan
 - Special/Engineered Lift Plan
 - Hoisting and Rigging: Lift Instructions Determination form (A-6003-884).

The record custodian identified in the Company Level Records Inventory and Disposition Schedules (RIDS) is responsible for record retention in accordance with TFC-BSM-IRM_DC-C-02.

7.0 SOURCES

7.1 Requirements

1. 10 CFR 851, "Worker Safety and Health Program."
2. DOE-RL-92-36, "Hanford Site Hoisting and Rigging Manual."
3. TFC-CHARTER-31, "Hoisting And Rigging Committee Charter."
4. TFC-ESHQ-S-STD-28, "Hoisting and Rigging Safety."

7.2 References

1. Lessons Learned Bulletin Number: IB-06-055. "Eyebolt and Swivel Hoist Ring Temperature Limitations." Nov. 27 2006.
2. RPP-8360, "Lifting Bail Evaluation Process."
3. RPP-9551, "Qualification Test of the Bail Repair Assembly & Bail Load Testing."
4. RPP-16330, "Standard Lifting Point Rated Load Capacities."

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5. RPP-CALC-25074, "Crane Outrigger Pad loads over Waste Transfer Lines."
6. TFC-BSM-IRM_DC-C-02, "Records Management."
7. TFC-ENG-DESIGN-C-06, "Engineering Change Control."
8. TFC-ENG-FACSUP-C-02, "Operability/Technical Evaluations."
9. TFC-ENG-FACSUP-C-23, "Equipment Identification and Data Management."
10. TFC-OPS-MAINT-C-01, "Tank Operations Contractor Work Control."
11. TFC-OPS-MAINT-C-02, "Pre-Job Briefings and Post-Job Reviews."

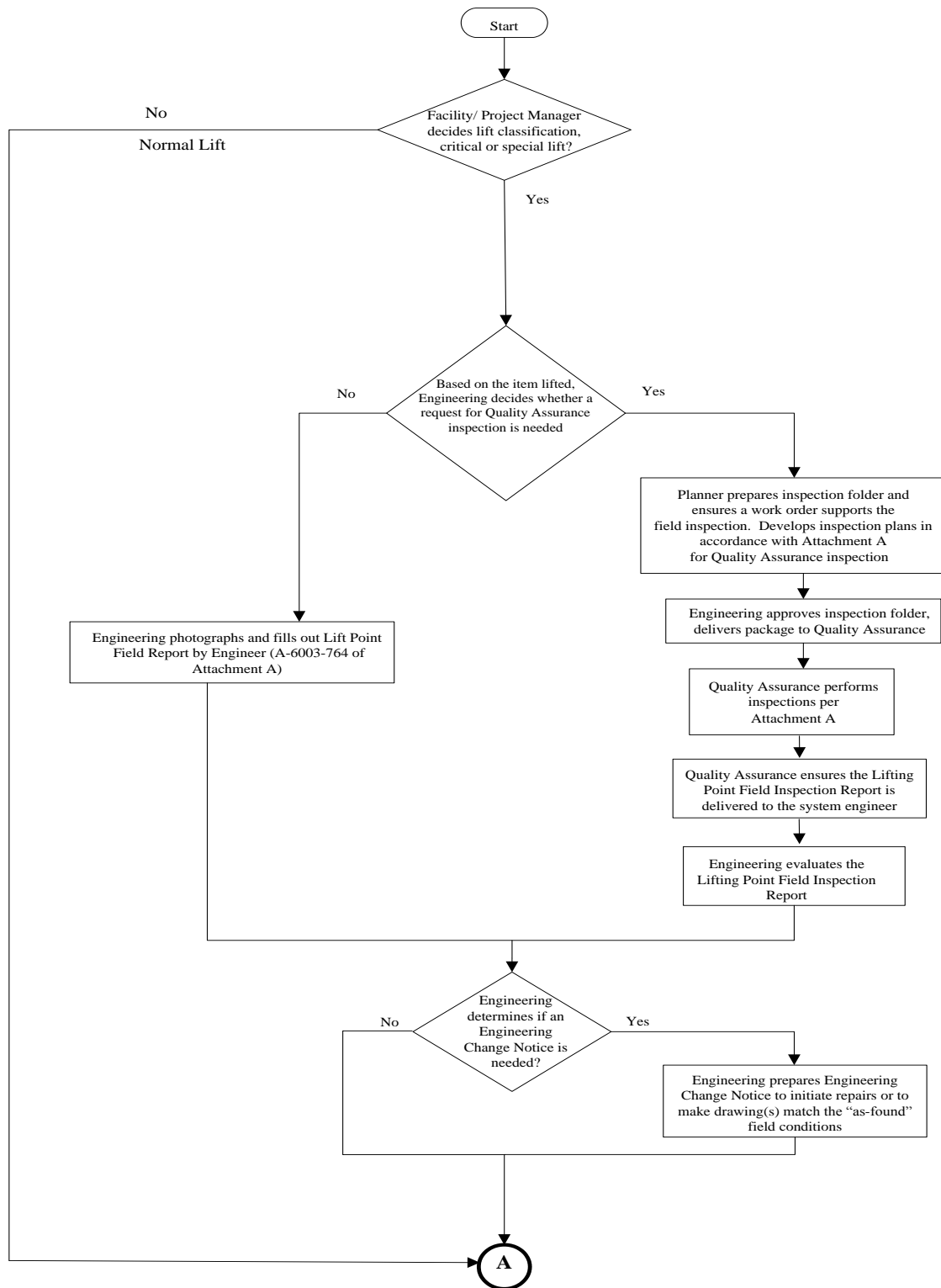
Figure 1. Verification of Lifting Point Structural Integrity Process.

Figure 1. Verification of Lifting Point Structural Integrity Process. (cont.)

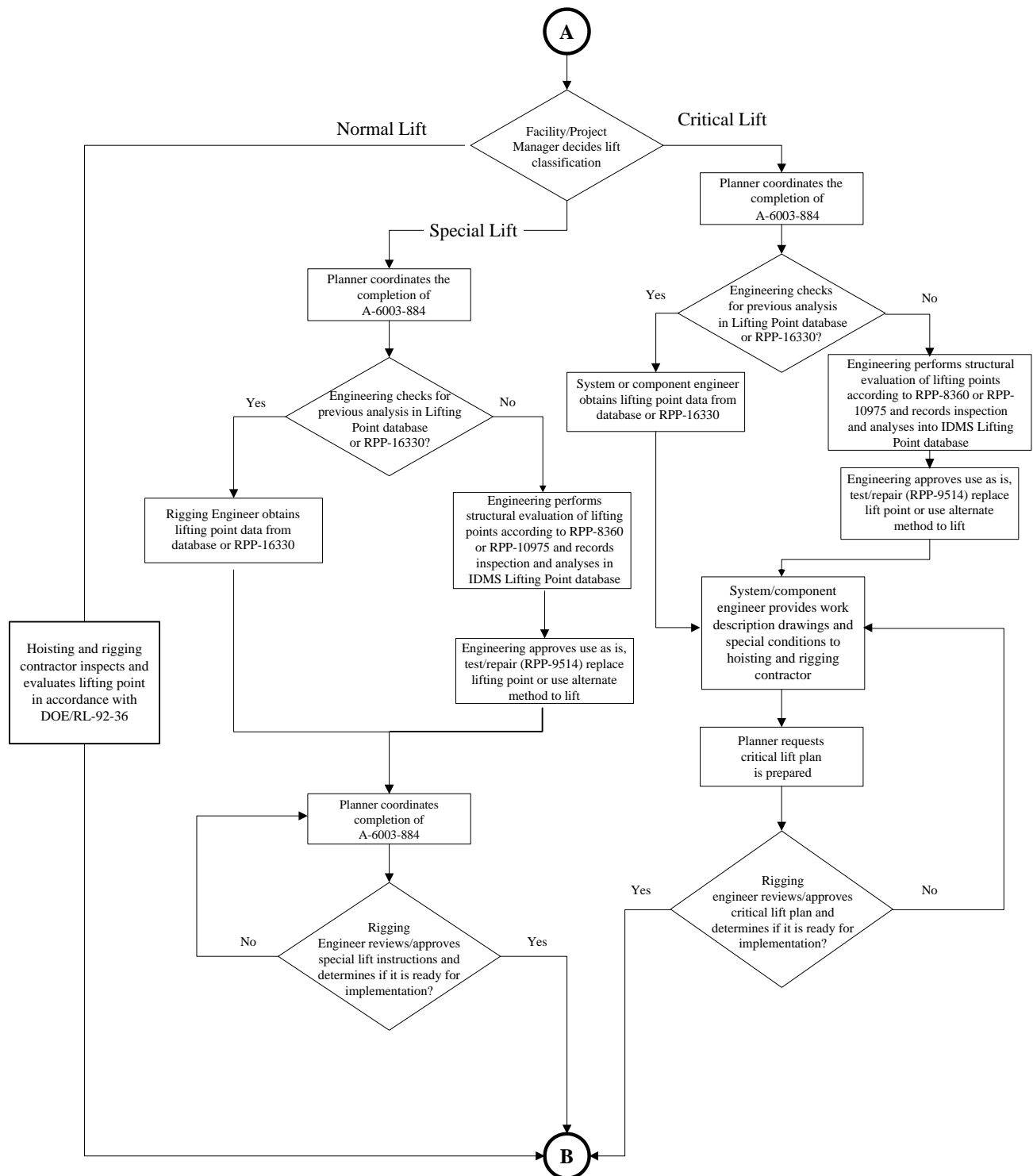


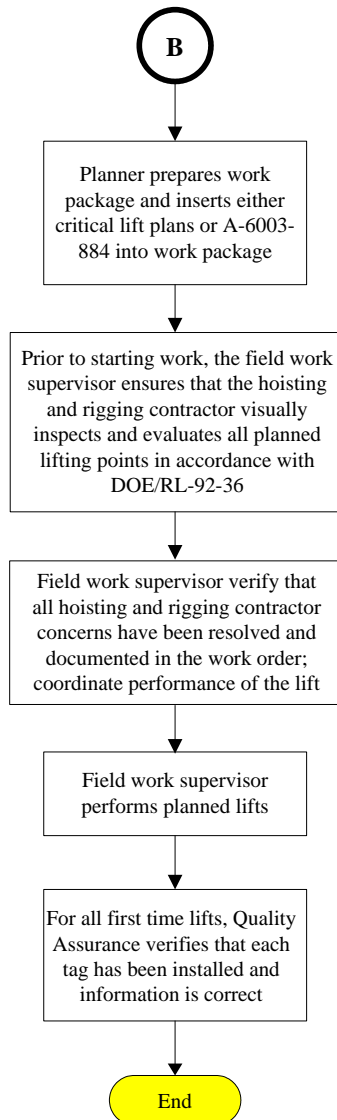
Figure 1. Verification of Lifting Point Structural Integrity Process. (cont.)

Figure 2. Inspection of Permanent Lifting Points Process.